Effects of chronic diseases and polypharmacy on death anxiety

Polypharmacy on death anxiety

Burcu Korkut[1], Nergiz Sevinç[2]
[1]Family Doctor Specialist, Karabuk Provincial Health Directorate Community Health Center
[2]Department of Public Health, Karabuk University Faculty of Medicine, Karabuk, Turkey

Abstract
Aim: Chronic diseases and polypharmacy are medical conditions that have negative effects on quality of life and mental state. The aim of this study is to investigate the effects of chronic diseases and the use of multiple concurrent medications on death anxiety within the context of sociodemographic characteristics. Material and Methods: This cross-sectional study included 324 individuals aged between 18-75 years who applied to Karabuk Community Health Center between November 2020 and February 2021. Twelve questions were asked to evaluate the socio-demographic characteristics of the participants. Participants' death anxiety levels were evaluated with the Turkish death anxiety scale consisting of 20 questions. The questionnaire and scale were applied to the participants by face-to-face interview technique.
Results: The average age of the participants was 43.6±13.27 years. The average death anxiety scale score of the individuals was found to be 47.0±11.63. Individuals aged 51 and over, women with 2 or more children, those with hypertension and osteoporosis due to chronic diseases, and participants who use 4 or more drugs per day had significantly higher levels of death anxiety (p<0.05).
Discussion: The death anxiety scale score obtained as a result of this study was found to be moderate. Organizing training on death anxiety, which impairs the quality of life of individuals, may positively affect individuals and cause them to become attached to life. Making the necessary changes to healthy lifestyles, early detection of common diseases and taking precautions, and avoiding multiple drug treatments as much as possible may be beneficial in increasing the quality of life and reducing death anxiety.

Keywords
Chronic Disease; Death Anxiety Scale; Polypharmacy

Introduction

Chronic diseases are medical conditions caused by various physiopathological processes, develop gradually, and require long-term treatment and care [1]. Regarding terminology, chronic diseases are also defined as non-communicable diseases (NCD). NCDs are considered the most important health problem worldwide because they currently lead to disabilities and death. NCDs cause yearly 15 million deaths in the population between the ages of 30 and 70 years, and 71% of all deaths are caused by NCDs [2]. In 2018, the global evaluation of the causes and rates of death related to chronic diseases revealed that the first-ranked four causes were cardiovascular disorders (44%), cancers (9%), chronic respiratory diseases (9%), and diabetes mellitus (4%) (World Health Organization, Noncommunicable diseases country profiles 2018). In the mortality statistics published by the Turkish Statistics Institute (TURKSTAT) in 2019, the first three causes of death were cardiovascular diseases (38.4%), cancers (19.7%), and respiratory system diseases (12.5%) (available at: https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2019-33710). The rate of chronic diseases increases with age. Studies conducted in our country have shown that 70-90% of individuals aged 65 years or over had at least one chronic disease [3]. The increases in the rate of chronic diseases lead to a raised need for healthcare services and medication [4].

On the other hand, polypharmacy is usually a secondary finding in cases with more than one chronic disease and is defined as the simultaneous use of multiple and different drugs [5]. Although the definition of polypharmacy includes limitations like two, three, four, five, or more drugs, in the majority of the studies it is defined as the use of five or more drugs [6]. It is well known that polypharmacy causes drug-drug and drug-disease interactions and adverse drug reactions [7]. Furthermore, complicated treatment schemes containing multiple drugs decrease patient compliance. Studies conducted in this context have demonstrated that polypharmacy was an important problem in the treatment of individuals [6]. Anxiety and death anxiety are more common in individuals with drug-related adverse events and interactions, chronic disease, and/or polypharmacy [8].

Death anxiety is an emotion, which is present from birth throughout the whole life, underlies all fears and plays an important role in the development of the structure of individuals' character. It develops after the emergence of awareness of the loss of oneself and the world, the possibility of being nothing [9]. The thought of death and its impact on human life are unavoidable, and this unmeasurably emerging thought of death harms the individual's psychology.

In this study, our objective was to investigate the relationship between chronic diseases, polypharmacy, and death anxiety within the context of socio-demographic characteristics. In this context, our goal was to include individuals aged 18 and above to evaluate the relationship between age and death anxiety and light the way for new studies with the obtained results.

Material and Methods

This cross-sectional study was conducted with 345 individuals between the ages of 18-75 who applied to the Community Health Center (CHC) in Karabuk city center between November 2020-February 2021. The population of the study consisted of 345 people who applied to CHC for the first time for nutritional counseling, marriage counseling, smoking cessation outpatient services, and cancer screening within the specified date range, and all of them were included in the study without sampling. Participation in the study was voluntary, and the participants were first informed about the study and their written consent was obtained. The questionnaire was applied to 332 people who agreed to participate in the study through face-to-face interview technique. Eight participants were not included in the study because they filled the questionnaire incorrectly or incompletely, and the study was completed with 324 people.

We received permission from the Ethics Committee for Non-invasive Clinical Research of XXX (No: E-77192459-050.99-9595 Subject: 2020/382), and XXX (No: 98024045-604.01.02). This study was conducted according to the principles of the Helsinki Declaration. A questionnaire consisting of 32 items was used to evaluate the relationship between chronic diseases, polypharmacy, and death anxiety level within the context of socio-demographic characteristics. In the first section of the questionnaire, the participants answered 12 questions about socio-demographic characteristics, such as age, gender, marital and education status.

This study analyzed the age according to socio-demographic characteristics: as 18-25 years, 26-35 years, 36-45 years, 46 years and above. The number of children was stated as 1,2,3,4 and above. The educational status was classified as primary school, middle school, high school, university, graduate and doctorate. At the stage of comparing socio- demographic characteristics with the death anxiety scale score, ages were grouped as 18-30 years, 31-50 years, 51 years and above, while the numbers of children were classified as no children, 1, 2 and above. Educational status were grouped as 12 years and below and above 12 years. In many studies in the literature, the number of drugs used for the definition of polypharmacy differs from each other, and since the use of 4 or more drugs is considered as polypharmacy, therefore in our study, the classification was made as 1-3 drugs and 4 or more drugs.

The Death Anxiety Scale (DAS), which was used in the second section of the questionnaire, was developed by Templer (1970) and was adopted by Sarıkaya (2013) to the Turkish Version. This 5-point Likert scale consists of 20 questions (Şenol C. Anxiety and Fears Regarding Death in the Elderly Living in Institutions in Ankara Province. Master Thesis, 1989) [10]. Regarding the answer options, "never" was scored with zero, "seldomly" with one, "sometimes" with two, "often" with three, and "always" with four. The scale provides a total score between 0 and 80, and higher scores indicate higher death anxiety. The investigation of the mean, standard deviation, standard error values, and rate of the selection of the options showed that a score between 30 and 47 points at moderate death anxiety, a score between 48-64 at high, 65-80 at very high, 13-29 at low and 0-12 very low death anxiety.

The items numbered 1, 2, 5, 6, 7, 9, 10, 11, 17, and 20 were attributed to the factor "the uncertainty of death"; 4, 8, 12, 13, 14, 16 and 19 under "thought and witness of death"; 3, 15, and 18 under "suffering". The validity and reliability analysis of the

Turkish version of the DAS was performed by Sarıkaya (2013), and the Cronbach's Alpha value was found to be 0.95.

The data were evaluated in a computer environment using the SPSS 25.0 program. The compatibility of DAS scores with the normal distribution was tested with the Kolmogorov–Smirnov test. Quantitative data were presented as arithmetic mean, standard deviation, and percent distribution. An unpaired t-test and one-way ANOVA test were used to compare the SDL scores of the groups formed according to sociodemographic characteristics (Post-Hoc comparisons with Duncan test). The relationship between the state of having some chronic diseases and the mean score of SCA of the individuals participating in the research was analyzed with the unpaired t- test. $P<0.05$ values were considered significant in all analyses. In the study, Pearson's chi-square test was used to evaluate the relationship between the age and number of children of the participants and the death anxiety scale score.

Results

Among the participants, 54.3% were females (n=176) and 45.7% males (n=148). The mean age was 43.62±13.27 years (min: 18; max: 75 years); 44.7% (n=145) of the participants were older than 45 years, 64.2% (n=208) were married, and 57.1% (n=185) were university graduates. The socio-demographic characteristics of the participants like age, gender, marital, and education status were summarized in Table 1.

The evaluation of the relationship between the scores of the Death Anxiety Scale and the socio-demographic characteristics is shown in Table 2.

The highest DAS score [50.13 (±12.04)] was in the age group of 51 and older. A statistically significant correlation was found between age and death anxiety (r=0.230, p=0.001). The death anxiety scale score was found to be statistically significantly higher in women than in men (p=0.000). The DAS score was also significantly higher in individuals who had two or more children [48.58 (±11.74)], and the correlation between the number of children and death anxiety was statistically significant (r= 0.205, p=0.003).

The statistical evaluation of the effects of chronic diseases and polypharmacy on death anxiety is summarized in Table 3.

The DAS score in hypertensive individuals was 48.91 (±11.79) (p=0.008). Patients with osteoporosis had a DAS score of 50.91 (±9.79), and death anxiety level was significantly higher in the osteoporotic participants (p=0.04). In the polypharmacy group, the DAS score was 49.30 (±11.13), so that the death anxiety was significantly higher in the individuals, who concurrently used 4 or more drugs (p=0.026).

Discussion

The increase in the prevalence of chronic diseases and polypharmacy is a result of the prolongation of the human lifespan, and it also increases the anxiety level caused by the death concept, which cannot be experienced. The death anxiety level is a psychological concept, which should be evaluated together with the physical health condition of the individuals.

This study was conducted with individuals between the age of 18 and 75 years and it was found that the DAS score (50.13 ±12.04) was significantly higher in individuals aged 51 and

Table 1. The Sociodemographic Characteristics of the Participants (n=324)

Sociodemographic Characteristics	n	(%)
Gender		
Female	176	(%54.3)
Male	148	(%45.7)
Age		
18-25	41	(%12.8)
26-35	49	(%15.1)
36-45	89	(%27.4)
46+	145	(%44.7)
Marital Status		
Married	208	(%64.2)
Single	98	(%30.2)
Divorced/Widow	18	(%5.6)
Education Status		
Primary School Graduate	17	(%5.2)
Secondary School Graduate	18	(% 5.6)
High School Graduate	73	(%22.5)
University Graduate	185	(%57.1)
Postgraduate/Doctorate	31	(%9.5)
Occupation		
Housewife	27	(%8.3)
Employee	23	(%7.1)
Officer	154	(%47.6)
Academician	2	(%0.6)
Other	11	(%36.4)
Social Security		
Yes	311	(%95.98)
No	13	(%4.01)
Income Level		
Low	28	(%8.6)
Middle	198	(%61.1)
High	98	(%30.3)
No. of Children		
1	58	(%29.1)
2	109	(%54.8)
3	27	(%13.6)
4 and more	5	(%2.5)

older. Although most of the previous studies reported that the death anxiety level decreased with the increased age (Özen D. The Effect of Death Anxiety on Daily Life Functions of Elderly People Living in Nursing Homes. Unpublished Master Thesis, Istanbul, Halic University, 2008), a few studies showed that death anxiety increased with age [11]. A study evaluating death anxiety in 304 individuals aged 18 to 87 years found out that death anxiety was highest in the twenties, reached the second peak in females in fifties, and decreased after the seventies [12]. Some studies demonstrated that the mutual evaluation of age with other sociodemographic characteristics would provide more reliable results [11,12]. In our study, we determined that age is a parameter that increased death anxiety. We believe that this result depends on the peak of death anxiety in individuals aged 50 and older.

In our study, in which we also evaluated the effects of gender, the DAS score of women was significantly higher. Females constituted 54.3% of the participants, and their DAS score

Table 2. The Sociodemographic Characteristics and Death Anxiety Scale Scores of the Participants (n=324)

Variables	n (%)	DAS score (mean±s.d.) (47.0±11.63)	Comparison	Evaluation p
Age				
18-30 years	59 (%18.2)	43.18 (±10.48)[a]		
31-50 years	166 (%51.2)	46.86 (±11.38)[a,b]	6.969*	0.001
51 years and older	99 (%30.6)	50.13 (±12.04)[b]		
Gender				
Female	176 (%54.3)	50.48 (±10.42)	5.840**	0.000
Male	148 (%45.7)	43.27 (±11.82)		
Education				
12 years and below	108 (%33.3)	48.21 (±12.59)	1.118**	0.264
12 years above	216 (%67.7)	46.68 (±11.12)		
Marital Status				
Married	208 (%64.2)	47.20 (±11.42)	0.022**	0.983
Single	116 (%35.8)	47.17 (±12.04)		
Social Security				
Yes	311 (%96)	47.09 (±11.63)	-0.717**	0.474
No	13 (%4)	49.46 (±12.03)		
No. of Children				
No Child	48 (%14,8)	42.25 (±10.90)[a]		
1 Child	74 (%22,8)	46.58 (±10.98)[a,b]	6.071*	0.003
2 and more	202 (%62,3)	48.58 (±11.74)[b]		
Chronic Disease				
Yes	289 (%89.2)	47.42 (±11.70)	1.041**	0.299
No	35 (%10.8)	45.25 (±11.05)		

*One-Way ANOVA (post-hoc Duncan test), **Student's t-test   a,b: The difference between groups that did not have the same letter in each column was considered significant. There was no difference between groups that had the same letter, p < 0.05 was considered significant.

Table 3. Chronic diseases and Polypharmacy with Death Anxiety Scale Scores (n=324)

Variables	n (%)	DAS score (mean±s.d.) (47.0±11.63)	Comparison	Evaluation p
Hypertension				
Yes	161 (%49,7)	48.91 (±11.79)	-2.67*	0.008
No	163 (%50,3)	45.49 (±11.25)		
Diabetes Mellitus				
Yes	149 (%46,0)	48.28 (±11.52)	-1.56	0.120
No	175 (%54,0)	46.26 (±11.68)		
Dyslipidemia				
Yes	166 (%51,2)	47.83 (±11.56)	-.1.01	0.311
No	158 (%48,8)	46.51 (±11.70)		
Coronary artery disease				
Yes	147 (%45,4)	46.72 (±11.61)	0.66	0.508
No	177 (%54,6)	47.58 (±11.67)		
Osteoporosis				
Yes	36 (%11,1)	50.91 (±9.79)	-2.04	0.041
No	288 (%88,9)	46.72 (±11.77)		
Multiple drug use				
Yes	221 (%68,2)	46.20 (±11.76)	-2.242*	0.026
No	103 (%31,8)	49.30 (±11.13)		

*Student's t-test

was 50.48 ±10.42 (Table 1). Madnawat and Kachawa (2007) and Depaola et al. (2008) found that death anxiety was high in females and increased with age [13,14]. The difference between females and males might depend on the cultural contrasts,

females' stronger ability to express their emotions and fears more easily, and males' disability to express their anxieties and fears due to gender-related labels. Most of the studies reported high DAS score in females, which is consistent with our study [13,14].

Regarding the education status, we determined that this parameter did not affect the DAS scores. Aktürk and Şahin (2019) investigated the effects of education variables on death anxiety, continuous anxiety, and hopelessness levels and found that the education level had no effect on death anxiety level in academicians, bankers, and teachers, but it affected death anxiety in the nurse group [15]. In the same study, it was shown that the death anxiety score of the health vocational high school nursing graduates was significantly higher compared to nurses with associate and bachelor degrees. The investigators stated that this result depended on the low knowledge level of high school nursing graduates. In our study, 67.7% of the participants had more than 12 years of education and there was no significant difference in their DAS scores. This may depend on the diversity of the occupational groups, religious beliefs, and ethnic origins.

Considering marital status, 64.2% (n=208) of the participants were married, but however, no significant relationship was found between marital status and DAS score. According to the results of the study conducted by Erdoğdu and Özkan (2007), the death anxiety levels were higher in married participants [16]. This finding indicates that the increased DAS Scores in married individuals depend on a high sense of responsibility for children and partners. Although the majority of the studies reported a correlation between marital status and DAS score, it was found in our study that marital status had no significant effect on the DAS score. This finding may depend on the one-center design of our study, low educational level, and young age of the participants.

Considering chronic diseases, there was no significant correlation with DAS scores, although 89.2% (n=289) of our participants had chronic diseases. Likewise, Sayın-Kasar et al. (2016) found that the presence of chronic diseases did not always increase death anxiety [17]. Although Karahan and Hamarta (2019) determined increased DAS levels in patients with at least three chronic diseases, they reported also that particularly in elderly patients with multiple chronic diseases, death anxiety and anxiety deteriorated quality of life [3]. These conflicting results may be a result of the limitations related to the one-center design of the majority of the studies, an increase in the prevalence of chronic diseases along with the prolongation of human lifespan worldwide, and an increased acceptance of chronic diseases by the population.

Diabetes mellitus was present in 46% of participants (n=149), but there was no significant correlation between diabetes mellitus and DAS scores. Adakan et al. (2017) conducted a study on patients with type 2 diabetes mellitus (n=217) and a control group (n=100) [18]. They could not find a statistically significant difference between the groups for DAS scores of the participants. DM is a common chronic disease, which does not cause complications if regular and correct treatment is applied. Awareness and knowledge levels about DM are continuously being increased in the population with the help of the tools like

social media and public service announcements. As a result of this, the death anxiety level was not affected by the presence or absence of diabetes mellitus.

Moreover, it was found that DAS scores in hypertensive individuals were significantly higher; 49.7% (n=161) of our participants were hypertensive and their DAS score was 48.91±11.79 (Table 3). Öztürk, Karakuş, and Tamam (2011) conducted a study on the elderly and determined that, as cardiovascular diseases are among the top causes of death, diseases like hypertension, which damage the vascular structure, remind patients of death and increase death-related worries and consequently increase significantly the death anxiety level in elderly with cardiac diseases and hypertension [19]. In our study, we determined that death anxiety increased in hypertensive patients, which was in line with the findings in the literature. This might depend on participants' awareness that hypertension increases the incidence of relatively more dangerous diseases such as heart diseases, cerebral hemorrhage, and kidney failure.

In this cross-sectional study, it was also found that there was a statistically significant correlation between polypharmacy and DAS score. We determined polypharmacy in 31.8% of our participants and their DAS score was 49.30 (±11.13). Karahan and Hamarta (2019) included two groups in their study [3]. The first group consisted of 30 patients with at least three chronic diseases, and the second group of 30 individuals with no chronic disease. DAS scores were 62.03±17.2, and 17.05±5.31 in individuals with polypharmacy (n=30) and the control group (n=30), respectively. The difference was statistically significant. In this study, we noticed that the presence of chronic disease and multiple drug use are factors, which increase anxiety and death anxiety in elderly subjects. Besides, the increase in the number of drugs and the negative effects on the investigated health parameters indicated a frequently overlooked "polypharmacy". Polypharmacy deteriorates prominently the quality of life. Particularly in elderly and single persons, death anxiety increases as a result of the worsened forgetfulness, which makes life relatively more difficult. In our study, it was found out that polypharmacy increased DAS scores being consistent with the findings in the literature.

Conclusion

In this one-center study with sample size, it was found that there was a statistically positive correlation between some sociodemographic characteristics like increased age, female gender, having 2 or more children, and death anxiety despite certain limitations of the study. In addition, we also determined a statistically positive correlation between hypertension, osteoporosis, and concurrent use of 4 or more drugs, and death anxiety. Healthcare professionals should be aware that patients diagnosed with chronic diseases and taking multiple medications, may experience changes in their emotional status and experience varying levels of anxiety. As chronic diseases and polypharmacy can increase the death anxiety level particularly in older female patients, sufficient information and psychological support should be provided at diagnosis and at the early stage of the disease to control the anxiety level. Besides, methods such as directing patients to social and physical activities, motivating them to start a hobby, and encouraging group activities can help to decrease death anxiety.

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